REMARKS

The Office Action dated August 8, 2007, has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

By this Response, claim 1 has been amended to more particularly point out and distinctly claim the subject matter of the present invention. Claims 14-25 have been cancelled without prejudice or disclaimer. Claim 27 has been added. No new matter has been added. Support for the above amendments is provided in the specification in at least Figure 2, and on at least pages 2 and 3. Accordingly, claims 1-13 and 26-27 are currently pending of which claims 1 and 26 are independent claims.

In view of the above amendments and the following remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending claim rejections for the reasons discussed below.

Claim Rejections under 35 U.S.C. §102(b)

Claims 1, 2, 14, 15, and 26

The Office Action rejected claims 1, 2, 14, 15, and 26 under 35 U.S.C. §102(b) as allegedly anticipated by Larson, *et al.* (U.S. Patent No. 5,444,242) ("Larson"). The Office Action alleged that Larson discloses or suggests every feature recited in claims 1, 2, 14, 15, and 26. Applicants respectfully submit that the claims recite subject matter that is neither disclosed nor suggested in the teachings of Larson.

Claim 1, upon which claims 2-13 and 26 are dependent, recites a charged particle spectrometer. The charged particle spectrometer is operable in a first mode using a hemispherical analyser to produce an energy spectrum relating to the composition of a sample being analysed. The charged particle spectrometer is also operable in a second mode using a spherical mirror analyser to produce a charged particle image of the surface of the sample being analysed. The charged particle spectrometer includes a detector which is used to detect charged particles produced in both modes of operation.

Applicants respectfully submit that certain embodiments of the present invention provide non-obvious advantages. Specifically, certain embodiments of the present invention relate to a spectrometer configured to operate in two modes of operation such that two different analysers can be used, with a single detector. Thus, certain embodiments provide a technical advantage in that a single detector can be used with two different modes of analysis using two different analysers.

As will be discussed below, Larson fails to disclose or suggest every claim feature recited in claims 1, 2, 14, 15, and 26, and therefore fails to provide the advantages and the features of the claims discussed above.

Larson is directed to an instrument for surface analysis which includes rastering an electron beam across an anode to generate x-rays. A concave Bragg monochromator focuses an energy peak of the x-rays to a specimen surface, the x-rays rastering the surface to emit photoelectrons. An analyzer provides information on the photoelectrons and thereby chemical species in the surface. A second detector of low energy

photoelectrons is cooperative with the rastering to produce a scanning photoelectron image of the surface for imaging of the specimen (Larson, Abstract; col. 3, line 23, to col. 5, line 15).

Applicants respectfully submit that Larson fails to disclose or suggest every feature recited in claim 1. Specifically, Larson fails to disclose or suggest, at least, "a charged particle spectrometer which is operable in a first mode using a hemispherical analyser to produce an energy spectrum relating to the composition of a sample being analysed, and in a second mode using a spherical mirror analyser to produce a charged particle image of the surface of the sample being analysed, wherein the spectrometer includes a detector which is used to detect charged particles produced in both modes of operation" as recited in claim 1 (emphasis added).

Rather, Larson only discloses a single hemispherical type analyzer 54 for imaging and detecting chemical species (Larson, Figure 1; col. 7, lines 34-55; col. 10, lines 13-28). Hence, Larson fails to disclose a spectrometer which is operable in a first mode using a hemispherical analyser to produce an energy spectrum relating to the composition of a sample being analysed, and in a second mode using a spherical mirror analyser to produce a charged particle image of the surface of the sample being analysed, wherein the spectrometer includes a detector which is used to detect charged particles produced in both modes of operation" as recited in claim 1 (emphasis added).

Therefore, Larson fails to disclose or suggest every feature recited in claim 1. Claims 2 and 26 depend from claim 1. Claims 14 and 15 have been cancelled without

prejudice or disclaimer. Accordingly, claims 2 and 26 should be allowable for at least their dependency upon an allowable base claim, and for the specific limitations recited therein.

Therefore, Applicants respectfully request withdrawal of the rejections of claims 1-2, 14-15, and 26 under 35 U.S.C. §102(b), and respectfully submit that claim 1, and the claims that depend therefrom, are now in condition for allowance.

Further, the Office Action rejected claims 1, 2, 14, 15, and 26 under 35 U.S.C. §102(b) as allegedly anticipated by Coxon, *et al.* (U.S. Patent No. 6,104,029) ("Coxon"). The Office Action alleged that Coxon discloses or suggests every feature recited in claims 1, 2, 14, 15, and 26. Applicants respectfully submit that the claims recite subject matter that is neither disclosed nor suggested in the teachings of Coxon.

As will be discussed below, Coxon fails to disclose or suggest every claim feature recited in claims 1, 2, 14, 15, and 26, and therefore fails to provide the advantages and the features of the claims discussed above.

Coxon is directed to a spectrometer and method of spectroscopy provided for surface analysis. The spectrometer includes an energy analyzer for analyzing the energies of charged particles liberated from a sample, a lens arranged to project a diffraction image of the analysis area at the image plane of the lens and a detector for detecting the charged particles. The analyzer and lens are arranged to generate an image at the detector in which the charged particles are distributed along a first direction

according to their emission angles and are distributed along another direction according to their energies. The detector is arranged to detect the distribution of charged particles in the image along the first direction to provide angle resolved energy spectra (Coxon, Abstract; col. 4, line 61, to col. 6, line 29).

Applicants respectfully submit that Coxon fails to disclose or suggest every feature recited in claim 1. Specifically, Coxon fails to disclose or suggest, at least, "a charged particle spectrometer which is operable in a first mode using a hemispherical analyser to produce an energy spectrum relating to the composition of a sample being analysed, and in a second mode using a spherical mirror analyser to produce a charged particle image of the surface of the sample being analysed, wherein the spectrometer includes a detector which is used to detect charged particles produced in both modes of operation" as recited in claim 1 (emphasis added).

Rather, Coxon only discloses a single analyser, hemispherical sector analyser 5, which includes an object or input plane 7, an image or output plane 9, and an energy dispersive axis 11 (Coxon, Figures 1 and 2; col. 6, lines 56 to 61). Hence, Coxon fails to disclose a spectrometer which is operable in a first mode using a hemispherical analyser to produce an energy spectrum relating to the composition of a sample being analysed, and in a second mode using a spherical mirror analyser to produce a charged particle image of the surface of the sample being analysed, wherein the spectrometer includes a detector which is used to detect charged particles produced in both modes of operation" as recited in claim 1 (emphasis added).

Further, Coxon fails to be capable of being operated to obtain spacial information. In Coxon, as illustrated in Figure 1, the lens system, including the quadruple lens formed from electrode sections 39, 41, 43, forms a "second real image" (1-dimensional) of the sample surface at the input to the hemispherical analyzer along the dispersive direction of the analyzer. In Figure 2, in the orthogonal, non-dispersive plane, the quadruple lens forms a "diffraction image" along the non-dispersive direction of the hemispherical analyser. Consequently, a 2-dimensional image of the sample surface is not formed at the position labeled as the "second real image." Even for the 1-dimensional image in the dispersive direction, the spatial information from the sample surface is not preserved at the detector because, as is well known for hemispherical analysers, object points at their entrance are imaged to diametrically opposite positions at their exit dependent on a convolution of the starting position at the analyzer entrance and the energy of the electron. Hence, the spatial information from the sample is not preserved at the detector.

Therefore, Coxon fails to disclose or suggest every feature recited in claim 1. Claims 2 and 26 depend from claim 1. Claims 14 and 15 have been cancelled without prejudice or disclaimer. Accordingly, claims 2 and 26 should be allowable for at least their dependency upon an allowable base claim, and for the specific limitations recited therein.

Therefore, Applicants respectfully request withdrawal of the rejections of claims 1-2, 14-15, and 26 under 35 U.S.C. §102(b), and respectfully submit that claim 1, and the claims that depend therefrom, are now in condition for allowance.

Claim Rejections under 35 U.S.C. §103(a)

Claims 3, 4, 16, and 17

The Office Action rejected claims 3, 4, 16, and 17 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Coxon in view of Faris, *et al.* (U.S. Patent No. 5,265,327) ("Faris"). Applicants respectfully submit that the claims recite subject matter that is neither disclosed nor suggested in the combination of Coxon and Faris.

Coxon was discussed above. Faris is directed to a process for fabricating microchannel plates which produces large area microchannel plates that have channel exit openings as small as 0.5 micron, MTF ~1, pitch-limited resolution, and a cost of $0.40/sq. centimeter (Faris, Abstract).

As previously noted above, Coxon fails to disclose or suggest every feature recited in claim 1. Faris fails to cure the deficiencies of Coxon. Specifically, Faris fails to disclose or suggest, at least, "a charged particle spectrometer which is operable in a first mode using a hemispherical analyser to produce an energy spectrum relating to the composition of a sample being analysed, and in a second mode using a spherical mirror analyser to produce a charged particle image of the surface of the sample being analysed, wherein the spectrometer includes a detector which is used to detect charged particles produced in both modes of operation" as recited in claim 1. Accordingly, Coxon in view of Faris fails to disclose or suggest every feature recited in claim 1.

Claims 3 and 4 depend from claim 1. Claims 16 and 17 were cancelled without prejudice or disclaimer. Accordingly, claims 3 and 4 should be allowable for at least their dependency upon an allowable base claim, and for the specific limitations recited therein.

Therefore, Applicants respectfully request withdrawal of the rejections of claims 3-4 and 16-17 under 35 U.S.C. §103(a), and respectfully submit that claim 1, and the claims that depend therefrom, are now in condition for allowance.

Claims 5-12 and 18-24

The Office Action rejected claims 5-12 and 18-24 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Coxon in view of Faris, and further in view of Wollnik, *et al.* (U.S. Patent No. 5,644,128) ("Wollnik"). Applicants respectfully submit that the claims recite subject matter that is neither disclosed nor suggested in the combination of Coxon, Faris, and Wollnik.

Coxon and Faris were discussed above. Wollnik is directed to a position sensitive fast timing detector for determining time-of-flight mass analysis and position of atomic particles. The detector includes a channel plate assembly for detecting the impact of one or more atomic particles transforming them into one or more electron clouds (Wollnik, Abstract).

As previously noted above, Coxon in view of Faris fails to disclose or suggest every feature recited in claim 1. Wollnik fails to cure the deficiencies of Coxon and

Faris. Specifically, Wollnik fails to disclose or suggest, at least, "a charged particle spectrometer which is operable in a first mode using a hemispherical analyser to produce an energy spectrum relating to the composition of a sample being analysed, and in a second mode using a spherical mirror analyser to produce a charged particle image of the surface of the sample being analysed, wherein the spectrometer includes a detector which is used to detect charged particles produced in both modes of operation" as recited in claim 1. Accordingly, Coxon in view of Faris, and further in view of Wollnik, fails to disclose or suggest every feature recited in claim 1.

Claims 5-12 depend from claim 1. Claims 18-24 were cancelled without prejudice or disclaimer. Accordingly, claims 5-12 should be allowable for at least their dependency upon an allowable base claim, and for the specific limitations recited therein.

Therefore, Applicants respectfully request withdrawal of the rejections of claims 5-12 and 18-24 under 35 U.S.C. §103(a), and respectfully submit that claim 1, and the claims that depend therefrom, are now in condition for allowance.

Claims 13 and 25

The Office Action rejected claims 13 and 25 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Coxon in view of Faris and Wollnik, and further in view of Abshire (U.S. Patent No. 5,566,139) ("Abshire"). Applicants respectfully submit that the claims recite subject matter that is neither disclosed nor suggested in the combination of Coxon, Faris, Wollnik, and Abshire.

Coxon, Faris, and Wollnik were discussed above. Abshire is directed to a time interval unit which operates in accordance with electronic sampling techniques and employing a pair of identical sampling interpolators which are respectively triggered at the start and stop of the time interval to be measured. Each time interval unit includes a GHz frequency sinusoidal clock signal generator and a time counter in the form of a pulse counter and a pair of sampling type interpolators which are respectively triggered on in response to a start and stop signal. When triggered, each interpolator samples the instantaneous amplitude of the in-phase(x) and quadrature(y) components of the sinusoidal clock signal. From the samples of the x and y components and the pulse counter's result, the elapsed time between two events is computed to a psec accuracy (Abshire, Abstract).

As previously noted above, Coxon in view of Faris, and further in view of Wollnik, fails to disclose or suggest every feature recited in claim 1. Abshire fails to cure the deficiencies of Coxon, Faris, and Wollnik. Specifically, Abshire fails to disclose or suggest, at least, "a charged particle spectrometer which is operable in a first mode using a hemispherical analyser to produce an energy spectrum relating to the composition of a sample being analysed, and in a second mode using a spherical mirror analyser to produce a charged particle image of the surface of the sample being analysed, wherein the spectrometer includes a detector which is used to detect charged particles produced in both modes of operation" as recited in claim 1. Accordingly, Coxon in view of Faris, and

further in view of Wollnik, and further in view of Abshire, fails to disclose or suggest every feature recited in claim 1.

Claim 13 depends from claim 1. Claim 25 was cancelled without prejudice or disclaimer. Accordingly, claim 13 should be allowable for at least its dependency upon an allowable base claim, and for the specific limitations recited therein.

Therefore, Applicants respectfully request withdrawal of the rejections of claims 13 and 25 under 35 U.S.C. §103(a), and respectfully submit that claim 1, and the claims that depend therefrom, are now in condition for allowance.

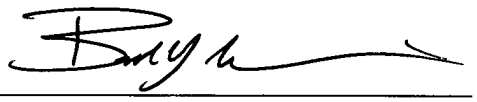
CONCLUSION

In conclusion, Applicants respectfully submit that Larson, Coxon, Faris, Wollnik, and Abshire, alone or in combination, fail to disclose or suggest every feature recited in claims 1-13 and 26-27. The distinctions previously noted are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-13 and 26-27 be allowed, and this present application be passed to issuance.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, Applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Enclosures: Petition for Extension of Time
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1 Reference
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